UNIVERSITY OF LONDON
INSTITUTE OF ARCHAEOLOGY

GEOCHRONOLOGICAL TABLE No. 1

AN ATTEMPTED CORRELATION OF QUATERNARY GEOLOGY, PALAEONTOLOGY AND PREHISTORY IN EUROPE AND CHINA

BY

WEN-CHUNG PEI
(Peking)

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EDITORIAL NOTE

The *Geochronological Tables* are intended to provide chronological information in tabular form, with a text as concentrated as possible and chiefly supplying the sources from which the tables in question are derived. As a rule, the series is not supposed to include original papers, but to supply the results of recent chronological work in an easily surveyable form, especially for the purpose of instruction. It is not restricted to any particular period.

Numbers in preparation will deal with the Postglacial chronology (Neolithic and Bronze Age), the chronology of the West European and Mediterranean Palaeolithic, the human finds and industries of Java, etc.

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AN ATTEMPTED CORRELATION OF QUATERNARY GEOLOGY, PALAEONTOLOGY AND PREHISTORY IN EUROPE AND CHINA[1]

By Wen-Chung Pei (Peking)

Introduction

THIS paper summarises the results of extensive research carried out on the Chinese Pleistocene, and compares them with the corresponding results of European geologists and archaeologists, the object being to arrive at a determination of the geological age of the important Hominid fossil remains called *Sinanthropus*, and found in a cave at Choukoutien not far from Peking. Evidence will be brought forward that *Sinanthropus* is of Lower Pleistocene age in spite of the lithic industry which exhibits a few features which, in Europe, do not appear until later. From the point of view of human evolution, *Sinanthropus* would be contemporary with the European *Eoanthropus* and *Homo heidelbergensis*, which both belong to the Lower Pleistocene. The European Quaternary probably covers four main periods of cold climate. During the same period in China four physiographic cycles may be observed in which phases of erosion alternated with phases of sedimentation. Lithological and palaeontological evidence suggest that the Choukoutien *Sinanthropus* deposits correspond geologically to the European interglacial Günz-Mindel, whilst the Chinese loess corresponds to the European cold periods III (Riss) and IV (Würm).

Notes Relating to the European Parts of Tables 1 and 2

Table 1 gives the time-ranges of some important Pleistocene mammals. In European Pleistocene faunas, three elements of different age may be distinguished, although they naturally merge into each other. They are:

(1) Pliocene survivals, such as *Machairodus*, *Elephas meridionalis*, *Rhinoceros etruscus*, *Equus stenonis*, *Trogontherium cuvieri*, perhaps *Ursus arvernensis*, and others.

[1] The explanatory text to these tables constructed by Dr. W. C. Pei, the discoverer of the skull of *Sinanthropus* at Choukoutien, near Peking, has been extracted and adapted from a large unpublished manuscript entitled "The Age of *Sinanthropus*."—F. E. Z.

(2) True Pleistocene, now extinct, forms, such as *Elephas antiquus, E. trogontherii, Megaceros* (*Sinomegaceros, Euryceros*), *Rhinoceros merckii, Hippopotamus major, Elephas primigenius, Rhinoceros tichorhinus, Ursus spelaeus, U. deningeri, Felis spelaeus, Hyaena spelaea, Bos primigenius,* etc.

(3) Recent species, such as *Canis lupus, Cervus elaphus, Rangifer tarandus, Equus caballus, Ursus arctos, Capra ibex,* etc.

These elements may be grouped in four stratigraphical assemblages as follows:

Assemblage 1 (Lower Pleistocene). With certain Pliocene survivals and with the first true Pleistocene forms and some forerunners of Recent species.

Assemblage 2 (Early Middle Pleistocene). With no Pliocene survivals except one or two (*Trogontherium*). True Pleistocene forms develop widely, as, for instance, the typical *Elephas antiquus,* and the number of uncharacteristic Recent species increases.

Assemblage 3 (Late Middle Pleistocene). Certain true Pleistocene forms become extinct, such as *E. antiquus, Rhin. merckii.* Arrival of some late true Pleistocene elements, such as *Bos primigenius, Elephas primigenius, Rhin. tichorhinus,* and presence of forerunners of some Recent arctic species such as *Rangifer tarandus.*

Assemblage 4 (Upper Pleistocene). Great and wide development of cold-loving forms and extinction of all true Pleistocene forms towards the end of this period. Many uncharacteristic Recent species.

Compare with these notes the corresponding notes on the Chinese Pleistocene fauna on page 5.

Homo, Prehistory, and Climatic Changes in Europe

As to the succession of species or subspecies of Man in Europe, it may suffice to refer to the publications, listed below, by Berckhemer, Boule, Keith, Smith, Soergel 1933, Woodward.[1]

The succession of prehistoric industries given in Table 2 is based chiefly on the work of Professor H. Breuil. Compare Breuil 1932, 1936, Breuil & Koslowski, Obermaier.

For the climatic changes observed in Europe, compare Breuil & Koslowski, Hinton, King & Oakley, Obermaier 1924, Sandford, Soergel 1926, 1933, Zeuner.

[1] It may be mentioned that, according to the recently published results of the Swanscombe Committee, the age of the Swanscombe skull has been established as Mindel-Riss Interglacial, i.e. earlier than indicated in Table 2. See Swanscombe Committee, 1938.—F. E. Z.

China

The results of Quaternary research in China up to May 1933 were summarised in a joint paper by Davidson Black and others, 'Fossil Man in China.'

(*a*) Pleistocene Faunas in China

Late Pliocene Assemblage.—The fauna of the lacustrine deposits of Nihowan, called Sanmenian I, contains, apart from Pliocene forms such as *Hipparion*, elements which are confined to this period, as, for instance, *Cervus boulei*, *Ochotonoides*, *Hyaena licenti* (equivalent to *H. arvernensis* in Europe?), *Ursus* cf. *etruscus*, as well as forms which survived into the true Pleistocene. Among these are *Rhinoceros* cf. *merckii*, *Rh.* cf. *tichorhinus*, *Elephas* cf. *namadicus* (corresponding to *E. antiquus* in Europe), *Nyctereutes sinensis*, *Machairodus*, *Siphneus tingi*. A few others even approach living forms. Some of the typically Pleistocene elements thus appear to occur earlier in China than in Europe.

Assemblage 1 (Lower Pleistocene).—This assemblage is well represented in Choukoutien, locality 1, where it is associated with *Sinanthropus*. In North China a similar fauna is known from a certain number of cliff deposits and from the reddish loam (zone C). In South and Central China a few localities exhibit a fauna of more or less the same age, as, for instance, Wanhsien in Ssuchuan, and Hsinanhsien in Kwangsi. This important fauna is composed as follows:

(1) Pliocene survivals: *Machairodus*, *Trogontherium cuvieri*, *Nyctereutes sinensis* (an equivalent of *Canis megamastoides* from the Pliocene of France), *Rhinoceros* cf. *merckii*, *Equus sanmeniensis* (probably a true Pleistocene form and not found in any later assemblage), *Stegodon* (South and Central China), *Chalicotherium* (Central China), etc.

(2) The true Pleistocene forms: *Elephas* cf. *namadicus*,[1] *Rhinoceros* cf. *tichorhinus*,[2] *Sinomegaceros*, *Ursus spelaeus* var. (equivalent

[1] Very poor elephant material has been collected at Choukoutien, and it has previously not been referred to a particular species. Judging, however, by the straight tusks and by a piece of the lamella of a molar, it is more likely to be *E. namadicus* than *E. primigenius*.

[2] Like *E. namadicus*, known from the Sanmenian as well as the later Sjara-Osso-Gol deposits, and, therefore, grouped as a true Pleistocene form.

of *U. deningeri* of Europe), *Hyaena sinensis*, *Felis youngi* (= *Felis leo* var. *spelaea* in Europe), etc.

(3) The earliest arrivals of Recent species: *Canis lupus*, *Ursus arctos*, many small rodents, etc.

A fauna called Sanmenian II is represented at Choukoutien, locality 13 and locality 9 (Teilhard and Pei 1934, Pei 1934, Teilhard 1936), and in the Taiku Basin, Shansi, North China. It differs from the typical Lower Pleistocene fauna in having *Siphneus tingi* and a special type of *Sinomegaceros*. It seems to be later than Pliocene, *Hipparion*, etc., being absent, but earlier than the typical Lower Pleistocene assemblage 1.

Assemblage 2 (Early Middle Pleistocene).—This is poorly represented at Choukoutien, locality 3; it can be characterised as follows (compare Pei 1936):

No Pliocene survivals are present. True Pleistocene forms have become modified, *Sinomegaceros*, for instance, having a more slender mandible than at locality 1. Living species increase in number, *Equus sanmeniensis*, for instance, being replaced by *E. hemionus*.

Assemblage 3 (Late Middle Pleistocene).—This is represented by a rich collection from the sandy facies of Sjara-Osso-Gol in Ordos. Stratigraphically it corresponds to the (? upper part of the) ' Loessic ' of North China. The main components of the fauna are:

(1) Some forms surviving from the earlier true Pleistocene, such as *Sinomegaceros*, *Elephas* cf. *namadicus*, etc.

(2) Some later Pleistocene types, such as *Bos primigenius*, etc.

(3) Many Recent species, *Cervus elaphus*, *Ovis ammon*, etc.

In North-East China (Manchuria, for instance) similar fossil faunas have been found (Yin 1931), in which, however, *Elephas antiquus* is replaced by the mammoth (*E. primigenius*). It is as yet unknown whether this means a chronological, or a geographical, difference.

Assemblage 4 (Upper Pleistocene).—This assemblage has previously not been separated from the preceding stage, but the absence of *Sinomegaceros* and *Spiroceros* (not known in Europe) indicates that it does represent a later stage. It is typically represented by the rich fauna of the Upper Cave of Choukoutien, the components being:

(1) Comparatively few true Pleistocene forms. *Hyaena ultima* (= *Hyaena spelaea*), *Ursus spelaeus*, etc.

(2) Many Recent species which, however, do not now exist in this region, some of them being restricted to South Asia or South

China, as *Cynailurus jubatus*, *Paradoxurus* cf. *larvatus*. The corresponding European assemblage contains many elements now restricted to arctic regions.

(3) A great percentage of species still existing in the region.

(*b*) Human Palaeontology in China

During the past ten years search for early Man in China has been fairly successful. The discovery of *Sinanthropus* in the Lower Cave of Choukoutien has thrown much light on human evolution in this part of the world. The discovery of human skulls and skeletal remains in the Upper Cave of Choukoutien, associated with an upper Palaeolithic industry and a very late Pleistocene fauna, gives us some idea of the last stage of Quaternary Man in China. There are other human fossils also. The finds so far made may be summarised as follows:

Sinanthropus (see Black 1931, 1933, 1934, Weidenreich 1935). Roughly speaking, his two main characteristics are the persistence of certain primitive characters, alongside with others approaching modern man. This combination reflects the condition of the contemporaneous fauna, which consists of primitive (Pliocene) elements mixed with more advanced forms. Thus *Sinanthropus* is well within the evolutionary stage of the whole fauna of the deposits.

In view of the ' advanced ' technique of the lithic industry of the *Sinanthropus*-layers, and in view of the scarcity of skeletal remains, doubts have been raised by some European scientists as to whether *Sinanthropus* was the maker of this industry or whether there was a second and more advanced type of man who made the implements and collected the *Sinanthropus* skull.[1] Professor Weidenreich (1935) has carefully examined this question and come to the conclusion that these doubts are without foundation, and in a recent letter Père Teilhard de Chardin tells me that the latest excavations have produced fresh evidence in favour of Professor Weidenreich's view. At present, therefore, we have to follow Professor Weidenreich and to assume that the Choukoutien quartz tools found associated with *Sinanthropus* were actually made by him, and not by another sort of man for whose existence there is no evidence whatsoever.

Early Middle Pleistocene Man.—At Choukoutien, locality 15,

[1] The same doubt was raised long ago in Europe with regard to Neanderthal Man and the Mousterian industry.

an industry was found (see below) indicating the presence of man, but no human remains have so far been recovered.

The Ordos Tooth.—One upper incisor of late middle Pleistocene age is known from the archaeological level at Sjara-Osso-Gol in Ordos. It is not sufficiently well preserved to draw any conclusions. Compare Licent, Teilhard, & Black (1927).

Man of the Upper Cave of Choukoutien.—Four nearly complete skulls and many skeletal bones have been found here. They certainly belong to *Homo sapiens*, again in accordance with the general phylogenetic level of the whole fauna. A report is being prepared by Professor Weidenreich.

(*c*) Palaeolithic Industries in China

The recent discoveries of Licent, Teilhard, Andersson, etc., have shown that China was well inhabited in Palaeolithic times.

Earliest Implements.—Professor H. Breuil considers as the earliest tool so far discovered in China a stone implement from the Nihowan lacustrine deposits, found in association with utilised bones (Breuil 1935). A chert implement of undoubted human origin was found at Choukoutien, locality 13. It seems to be of early Lower Pleistocene age, and shows a technique similar to the Abbevillian of Europe, both its faces being flaked alternatingly.

The Choukoutien Sinanthropus Industry.—This industry, which represents the early Lower Palaeolithic in China, has been found at Choukoutien, locality 1 only.

The lithic industry is a flake industry. The rough material usually is quartz. Many thousands of flakes without secondary working have been collected, and well-retouched implements are rare. There are, however, scrapers, points, chisels, choppers, and a few burins, and even one or two pieces of Solutrian technique. Comparing this industry with those of Europe, one recognises affinities to the Clactonian, Tayacian, Mousterian, and Upper Palaeolithic, but none of the type tools of these industries is present. A side-scraper, which is the most common implement of the *Sinanthropus* industry, may, in Europe, be found in any level from the Clactonian up to the Magdalenian.

Utilised bones and antlers form another part of the *Sinanthropus* industry. They are being studied by Professor Breuil and the writer.

In Europe, traces of fire made by prehistoric man are hardly known before the Mousterian, but there is definite evidence of the

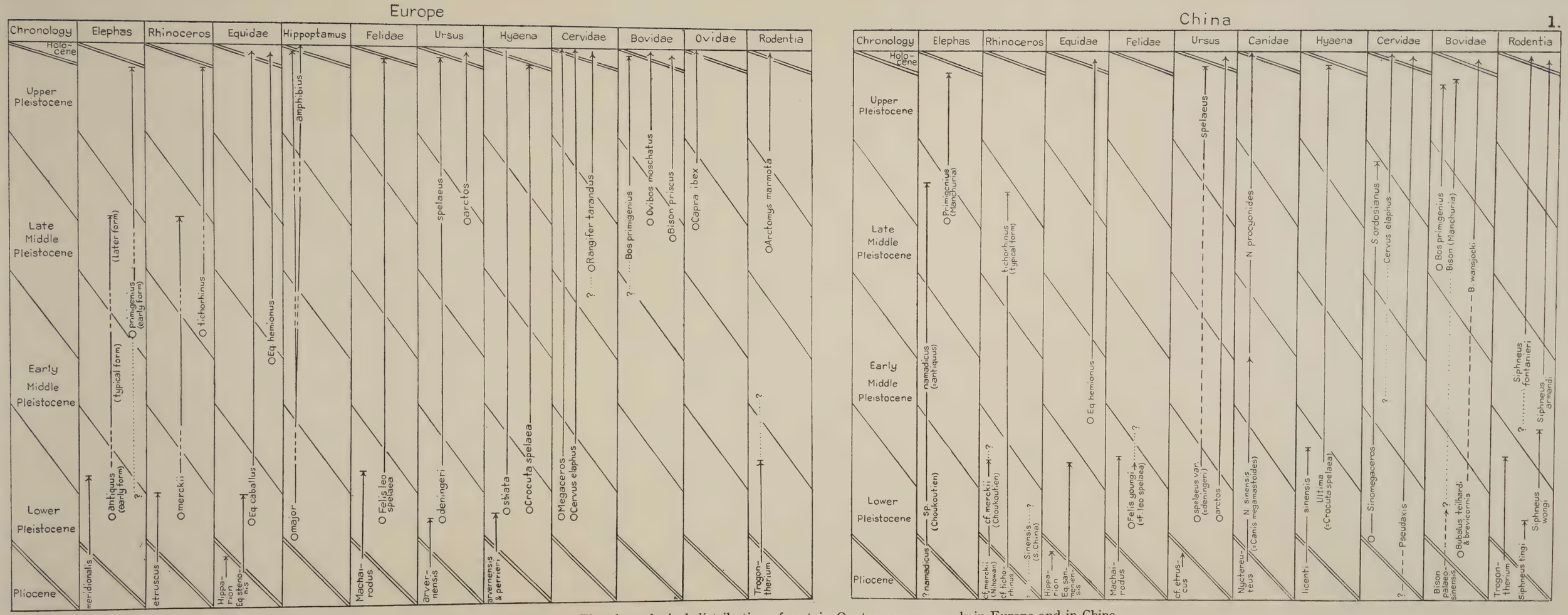

TABLE 1.—The chronological distribution of certain Quaternary mammals in Europe and in China.

NOTE.—"O" indicates the earliest known time when a form became recognisable as a definite species. ↑ indicates approximately the time when a form became extinct. The broken line - - - - - indicates temporary absence from Central Europe, or North China, respectively, and the dotted line . . . . . indicates that the presence is doubtful.

use of fire in *Sinanthropus* times in China. It is, however, possible that in European open-air sites the evidence of fire has disappeared, whilst in the Cave of Choukoutien it has been preserved.

Late Lower (or Early Middle) Palaeolithic.—At locality 15 of the Choukoutien region we collected many hundreds of chert and quartz implements in 1934 and 1935. The geological age of this site seems to be earlier than that of locality 3 and later than that of the *Sinanthropus* locality (locality 1). This is indicated by the presence of a large *Rhinoceros tichorhinus* and *Syphneus fontanieri*, which both are supposed to be typical of the Chinese loess. The fauna, however, has still to be studied in detail.

The industry of this locality is generally fairly similar to that of the *Sinanthropus* locality, but, on the whole, the implements are better retouched, and more kinds of tools can be recognised. A larger proportion is made of better materials than quartz, such as flint, chert, hard sandstone, etc. Side-scrapers, chisels, points, etc., are present. This industry has not yet been studied in detail.

The Ordos Industry (Middle, or Late Middle Palaeolithic).—The Ordos industry, found at Shuaitungkou and Sjara-Osso-Gol, was discovered by Pères Licent and Teilhard, and described by Professor Breuil. The accompanying fossils assign it to the late Middle Pleistocene. Points, scrapers, borers, gravers, etc., though slightly better retouched, are comparable to those of the *Sinanthropus* level, but there are also many microliths (micro-gravers, micro-points, etc.). These, if found in Europe, would be dated as fairly late Upper Palaeolithic. The micro-burin at least is, in France, not known before the Magdalenian. There are certain pieces in the Ordos industry which remind one of the European Mousterian and Aurignacian, but as far as the technique is concerned it is impossible to find a European equivalent of the Ordos industry.

The Industry of the Upper Cave of Choukoutien (Upper Palaeolithic).—This industry is poor in stone implements, of which only a small number of scrapers, points, etc., have been found. These are made of flint or quartz, and especially the latter are, in workmanship, hardly superior to those of the *Sinanthropus* deposits. It is in the worked bone, and in the presence of ornamental objects (perforated pebbles, teeth, and shells; bone needles, pendants, etc.) that the Upper Cave industry proves to be more advanced than the *Sinanthropus* industry. With the exception of the bone pendants, the mentioned ornamental objects are known in Europe from the Aurignacian to the Neolithic, and they are found in the Chinese

Neolithic as well. The accompanying fauna, however, includes certain extinct forms, and animals now restricted to South Asia. The industry, therefore, cannot be as late as Neolithic; it is probably of Upper Palaeolithic age.

(*d*) Geology in China

In the Huangho basin, North China (provinces Shansi, Shensi, Honan, and Kansu), three kinds of late Cenozoic deposits may be recognised, namely, a slope-facies, a lacustrine or fluvio-lacustrine facies, and a fissure- or cave-facies. Combining these three sets of deposits, the succession of the late Cenozoic of North China is as follows:

(1)	Pontian	Early Pliocene	with *Hipparion richthofeni*
(2)	(no name)	Middle Pliocene	with *Mastodon, Stegodon,* small *Hipparion,* etc.
(3)	Sanmenian I	Late Pliocene	with large *Hipparion* and *Equus*
(4*a*)	Sanmenian II	Lower Pleistocene	with faunal assemblage I (*Sinomegaceros, Siphneus tingi,* etc.)
(4*b*)	Choukoutien	Lower Pleistocene	with faunal assemblage I (*Sinanthropus, Sinomegaceros,* etc.)
(5)	(no name)	Early Middle Pleistocene	with faunal assemblage II (Loc. 3 of Choukoutien)
(6)	Loessic	Late Middle Pleistocene	with faunal assemblage III
(7)	(no name)	Upper Pleistocene	with faunal assemblage IV (Upper Cave at Choukoutien)

These deposits represent phases of sedimentation separated by phases of erosion. Combining each phase of erosion with the following phase of sedimentation in a 'cycle,' seven such cycles may be distinguished, of which four belong to the Pleistocene:

Tanghsien Paote	Erosion Sedimentation	Cycle I	Lower Pliocene
X (no general name) Y (no general name)	Erosion Sedimentation	Cycle II	Middle Pliocene
Fenho Lower Sanmen	Great erosion Sedimentation	Cycle III	Late Pliocene
Z (no general name) Upper Sanmen	Erosion Sedimentation	Cycle IV	Lower Pleistocene
? (uncertain) Choukoutien	Erosion Sedimentation	Cycle V	Lower Pleistocene
Chinghsui Malan	Erosion Sedimentation	Cycle VI	Middle Pleistocene
Panchiao Alluvium	Erosion	Cycle VII	Upper Pleistocene and modern

In the Yangtze valley and in South China, geological evidence indicates similar cycles.

In 1934 Professor J. S. Lee found indications of a glaciation in Lushan in Central Yangtze. From the geomorphological features of the region and the characters of the deposits he argued that the Lushan and other areas of the Yangtze valley were glaciated in the Pleistocene. According to him, U-shaped valleys, drumlin, and boulder-clay are present. According to Dr. Barbour, however, the Lushan 'boulder-clay' may be older than Pleistocene and explained by phenomena other than glaciation. Should Professor Lee prove his point, much help would be given to work on correlation, but until more, and conclusive, evidence is brought forward, the problem of a Pleistocene glaciation in China cannot be regarded as settled.

Correlation

The correlation proposed in the tables 1 and 2, naturally, is tentative. It is based on the evidence summarised in the preceding paragraphs.

From the geological point of view, one can say that, speaking generally, Europe and China have two series of Pleistocene deposits in common. The older series consists chiefly of gravels and sands, and covers the period from the late Pliocene to the early Pleistocene. The younger series is characterised by the frequent occurrence of loessic material. These two series in Europe and in China can be correlated stratigraphically, lithologically, and faunistically, but it is impossible to go further and into details.

In Europe, four main cycles of climatic evolution are recognisable in the Pleistocene, with alternations of cold and mild periods. In China, four physiographical cycles have been observed in the Pleistocene, although one of these cycles is not yet well established. One may be inclined to correlate the four Chinese cycles with the corresponding European ones, especially since the palaeontological evidence would support such procedure. We have, however, no knowledge of the duration of the various cycles in question, and the problem arises whether the periods of aggradation in China correspond to the cold periods in Europe, or to the warm interglacials. Thus, a large number of possibilities for a tentative correlation of the phases in Europe and China may be deduced, but, unfortunately, no evidence is as yet available showing that any one of them deserves to be

preferred. It is, therefore, premature to base a correlation of the Chinese and European Pleistocene formations with their contained human relics on geological observations only.

A correlation on a purely palaeontological basis is, at the present state of our knowledge, undoubtedly more reliable. Nevertheless, serious difficulties obtain, such as (1) the incompleteness of the material available, (2) the importance of the geographical element in the composition of the faunas, and (3) the possible identity of forms which received different names in Europe and in China. As regards the last difficulty, I have, throughout this paper, added in brackets probable synonyms wherever I have been able to judge from personal experience. In order partly to overcome the other difficulties, I have been anxious to consider only the general aspects of the faunas, not paying too much attention to the presence, or absence, of a single species. For example, *Rhinoceros* cf. *tichorhinus* is known from the Upper Pliocene Nihowan deposits, whilst in Europe it does not become frequent before the Upper Pleistocene. This species is, in China, obviously of no stratigraphical value.

The early Sanmenian fauna in China corresponds to the Villafranchian in Europe. The main fossiliferous localities of this phase in Europe are: in England: Norwich Crag, Doveholes near Buxton; in France: Perrier near Issoire, St. Prest near Chartres, sands of Chagny, sands of Puy d'Auvergne; in Germany: Mosbach near Wiesbaden (middle level); in Italy: lower Val d'Arno, Villafranca d'Asti. The Italian fauna is, in accordance with the geographical latitude, different from that of West and Central Europe, which latter only is listed in the accompanying Table 1.

The Choukoutien fauna (*Sinanthropus* level, locality 1) corresponds in Europe to a fauna sometimes called Cromerian. The main localities of this age in Europe are—in England: Cromer Forest Bed; in France: Champs de Mars at Abbeville, Solilhac near Blanzac; in Germany: sands of Mauer near Heidelberg, Süssenborn near Weimar; in Italy: Upper Val d'Arno. These faunas, as the corresponding ones in China, are characterised by the 'faunal assemblage 1.' The fauna of the Sanmenian II also seems to belong here. To support the view that the *Sinanthropus* level is contemporary with the Cromer Forest Bed, I may mention that on the occasion of a visit with Mr. C. D. Ovey, Dr. F. E. Zeuner, and others to Mr. A. C. Savin's famous collection at Cromer, I noticed with great interest that both *Sinomegaceros* and *Ursus deningeri* were members of the Forest Bed fauna.

The fauna of the locality III of Choukoutien (assemblage II) corresponds to the early Middle Pleistocene fauna in Europe. This, unfortunately, is badly represented. I am inclined to refer to this phase the lower gravels of Barnfield Pit, Swanscombe, England, and the higher level at Steinheim, Württemberg, Germany.

Assemblage III, the loessic fauna, represented in China by the Sjara-Osso-Gol deposits, corresponds, in Europe, more or less to the fauna accompanying Neanderthal Man. Some important localities of this time are Ehringsdorf, Krapina (earlier phase); La Chapelle-aux-Saints, La Quina (later phase).

Assemblage IV is, in China, represented by the fauna of the Upper Cave of Choukoutien. In Europe, it accompanies the Upper Palaeolithic industries. Localities are too numerous and too well known to be listed here.

Prehistory itself helps very little in correlating China and Europe, the workmanship of the stone implements of these two regions being too different. If, however, my suggestions given on the preceding pages are correct, then the implement of Choukoutien, locality 13, and the *Sinanthropus* industry would both be contemporary with the Abbevillian of Europe. If the mentioned implement represents a separate industry, then, while the biface-makers of Abbeville and the flake-users of Clacton were occupying Europe, two peoples were living in China, also fashioning their implements in different ways. The industry of locality 15, similar to the *Sinanthropus* industry, and possibly made by him, would correspond to the early Acheulian, late Clactonian, and Tayacian of Europe. The Ordos industry, which comes next in the Chinese succession, would, if I am right, correspond to middle and late Acheulian, Micoquian, early and middle Levalloisian, and Mousterian of Europe. Finally, the Upper Cave industry of Choukoutien would be contemporary with the Upper Palaeolithic of Europe, i.e. the Aurignacian, Solutrian, and Magdalenian.

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General			Europe				China		
Chronology		Industry	Cycle of Changing climate	Fossil man	Industry: Biface	Industry: Flake	Geologicol sequence	Fossil man	Industry
Holo-cene	Holocene	Neolithic Mesolithic	temperate	Homo sapiens	Neolithic Mesolithic		Upper Cave of Choukoutien	Upper Cave man of Choukoutien	Upper Cave Industry of Choukoutien
Pleistocene	Upper Pleistocene	Upper Palaeolithic	Cold Period 4b (Würm 2)	Homo Sapiens fossilis	Upper Palaeolithic				
			?temperate	Grimaldi Crô-Magnon	Magdalenian	Late Levalloisian Lev. VII			
					Solutrean				
					Aurignacian	Lev. VI			
			Cold Period 4 (Würm)	Homo neander-thalensis	Moust-erian	Moust-erian	Sandy facies of Loess at Sjara-osso-Gol in Ordos	The Ordos tooth	The Ordos Industry
	Late Middle Pleistocene	Mousterian (Sensu Lato) Middle Palaeo-lithic			Ach. VII	Micocquien Lev. V			
			temperate		Ach. VI	Middle Levalloisian Lev. IV			
						Lev. IIIb			
			Warm	Neanderthaloid (early form)	Late Acheulean	Tayacian II			
			temperate	Krapina	Ach. V		Loess	?	
				Ehrings-dorf	Ach. IV	Middle Levalloisian			
					Ach. IIIb	Early Levalloisian Lev. IIIa			
			Cold Period 3 (Riss)	Swans-combe (?)		Lev. II			
					Ach. IIIa	Lev. I			
			temperate			Tayacian I			
	Early Middle Pleistocene	Acheulean (Sensu stricto) Late Lower Palaeo-lithic		Steinheim	Early Acheulean Ach. II	Clactonian III			
			Warm						
			temperate		Ach. I	Clactonian II	Locs. 3 & 15(?) of Choukou-tien		Loc. 15-Industry of Choukou tien(?)
			Cold Period 2 (Mindel)			Clactonian I			
			temperate	Homo heide-lbergensis Eoanthropus	Abbevillean (=Chellean)		Loc. 1 (or Sinanthropus Locality) of Choukoutien	Sinanthropus	Sinanthro-pus Indus-try of Chou-koutien
	Lower Pleistocene	Abbevillean (=Chellean) Early Lower Palaeo-lithic	Warm						
			temperate				Loc. 13 of Choukou-tien		Loc. 13 Chert implement of Choukou tien
			Cold Period 1						
Plio-cene	Pliocene	?		Unknown	?	?	Sanmenian (Nihowan)		

TABLE 2.—An attempted correlation of geology, fossil man, and prehistory in the Quaternary periods of Europe and China.